: Yamasaki--221 N-5 (1896-1897) 1900 Formosans
16, 101

When the Portuguese voyagers pushed forward into the East China Sea, during the pening decades of the 16th century, they found a large island to which they gave the ame of Formosa ("beautiful"). It appears with this name, for the first time, on a map ublished in 1550. Until later than the middle of the century this name was used in urope almost exclusively. Gradually there appeared beside it the Chinese name for he island, Taiwan, and when the island was taken over by the Japanese in 1895, this ame was taken over too.

9: Yamasaki--221[2] N-5 (1896-1897) 1900 Formosans
116, 175

The settling of the western half of Taiwan by the Chinese occurred in the 17th century. From that time on China, in her dealings with other powers, laid claim to the whole island, including the mountainous east, where Malayan clans nevertheless preserved their independence and no foreigner forced his way in, either Chinese or European. So our knowledge of the island also remained limited almost entirely to the low-lying western half cultivated by the Chinese.

9: Yamasaki--221[3] N-5 (1896-1897) 1900 Formosans
116, 114, 122

With the transfer of the island to Japan, it entered a new age, not only politically, but also with regard to its scientific investigation. This begins in 1896-97 with an expedition that was organized by the University of Tokyo. Among others, the Professor of Geology, Dr. B. Kotō, took part, and the writer of these lines had the good fortune to accompany him as his assistant.

9; Yamasaki--221 [4] N-5 (1896-1897) 1900 Formosans
116, 121

For five months, and starting from Kilung, we went round the greater part of the island, constantly pushing into the interior from various parts of the coast, as the red line on the accompanying map shows. [MC: see next slip for adaptation of map. For full scale map in color see source: page 298, plate 19] Only once, on the eastern side of Taiwan, did our paths separate, Professor Kotō starting from Pinan and following the longitudinal valley of the Pinan, Shūkoran and Karenkō rivers to the mouth at the locality called Karenkō, while I reached this place along the precipitous coast. In this way we got to know the western plain, the mountainous country between it and the central mountain chain, the rushing upper course of the Dakusuikei, the largest river on the island, the southern point of the island, a considerable part of the east coast and various regions inhabited by natives. Finally we made our way back by steamer from Karenkō to Kilung and on to Tokyo.

9: Yamasaki--221[5] N-5 (1896-1897) 1900 Formosans
116, 101, 131

The Taiwan island group embraces the chief island of Taiwan (Formosa), the Hōko-tō or Pescadores Islands and a number of accessory islets. To these last belong: Kōtō-sho (Botel-Tobago), Shōkōtō-sho (Small Botel-Tobago), Kashō-tō (Samasana), Shō-ryūkyū-tō (Lambay Island), Kisan-tō (Steep Island), Agincourt and some even smaller rocky islands. The group lies opposite the Chinese province of Fōkien which, in keeping with a treaty with Japan, the Chinese Government may not cede to other nations. The Taiwan Islands form the southern end of the three great Japanese island groups which, in three curves, cut off three of the eastern Asiatic bordering seas from the Pacific Ocean. In the north west we have the Ryūkyū (Riukiu) Islands. These form a whole with Taiwan not only geographically but also geologically, and in the south are separated by the Bashi Straits from the Batan Islands, the northernmost group of the Philippines.

9: Yamasaki--221 [6] N-5 (1896-1897) 1900 Formosans
116, 131

The chief island of Taiwan, which forms a longish oval, lies between latitudes N. 21° 54′ and 25° 18′ and longitudes E. 120° 45′ and 122° from Greenwich. The length from north to south is 395 km., and the greatest width in the middle of the island is 123 km. In the southern part the island narrows towards the 22nd parallel, which it crosses at two points. The total area is almost 34,700 sq. km., while that of the other smaller islands amounts to about 200 square km.

9: Yamasaki--221 [7] N-5 (1896-1897) 1900 Formosans
116, 161

In 1897 the first census of Taiwan showed a population of 2,584,365 inhabitants, excepting the savage natives.

9: Yamasaki--221-222 / N-5 (1896-1897) 1900 Formosans
116, 133

The topography of Taiwan isla[illegible] is pretty regular and simple. The chief watershed extends longitudinally from Bitōkoku or Cape Pitaûat at the northeastern end through the island as far as the southern point of Garampi, but does not always follow the crest of the folded mountain range, which takes the same direction. This range—we shall call it the Niitaka Chain after its highest peak and the Central Chain from its position with regard to two other smaller chains—begins at [222] the northeast coast near Dom-Kaku (Cathedral Spire) and first turns WSW towards Setsu-san (Mount Sylvia, 3424 m.) on the watershed, and then along this to the south as far as the southern point. It is not a volcanic formation, as was formerly thought, but a folded range, consisting chiefly of old schists and crystalline limestone. About halfway along the chain there rises Mount Morrison (4145 m.), which we now call Niitaka-yama. Its peak consists of dark clay slate and it is the highest in the Japanese Empire.

To the west of the Central Chain and parallel to it by tertiary formation there extends a second mountain chain, which begins at Bito-Kaku (Pitao Point) and stretches beyond the 23rd parallel to the south. We call it the Kali Chain, after the second highest mountain, the Kali-san (2142 m.). To the northwest of Niitaka-yama a Plutonic elevation reaches a height of 2830 m. in the Tōkan-san.

The third mountain chain also dates from the Tertiary age and extends in the same direction as the other two a distance of 60 km. along the east coast from Pinan to Karenkō. It is separated from the chief chain by the longitudinal valley of the Karenkō, Shūkoran and Pinan Rivers. We call it the Taitō Chain (East Taiwan Chain).

Strictly speaking, the Niitaka and Kali Chains, like the strike of the strata, run from ENE to WSW in the north, and then gradually change to run NE to SW, and finally from north to south. Consequently the chief range forms a curve whose inner or concave side is turned to the Pacific Ocean, while on Honshū (the chief Japanese island), the steep concave side faces the Asiatic mainland. The eastern side or inner declivity of the main chain is very steep, and the foothills of the chain sink rapidly to the plain of Taitō (East Taiwan) or directly to the sea. From here the limestone layers that form a mighty zone on the upper part of the declivity are an imposing sight, and this is enhanced, when, as often happens, a bank of cumulus cloud floats quietly in the air beneath it. At the place on the east coast between Soō and Shinjō, where the chain ends, it appears as a splendid cliff which rises precipitously out of the Pacific to a height of not less than 1,100 m., and is doubtless one of the finest sights on the island.

The chain has many high peaks, most of them not yet climbed. Among these there rise, on the southern side of the plain, Kapsulan, and, in the northeast of the chain, Taihaku-san (1,052 m.), Taigen-san (1,182 m.), Taiko-san (1, 431 m.,) Jūsampun-san

(1,432 m.). To the southwest of them is seen the Setsu-san or Snow Mountain, which is known as Mount Sylvia on European maps and is 3,424 m. high. Farther to the south there follow, on the watershed, the Piroku-san, Gōkan-san and Nōkō-san. Situated to the west-southwest of these, one branch of the Kantāban-san reaches the main chain at the middle course of the Dakusui-kei, with a height of 3,017 m. The connecting mountain of Bun-sui-rei or Chūkai-rei, which leads over the chain from Linkiho to Basshishō, is 3,240 m. high. The enormous, circus-shaped limestone crag on the western part of the crest of Basshishō rises to a height of 2,148 m. The crest extends rather in a southwesterly direction with the high peaks of Shūkoran-san, Tandai-san, Gundai-san to Niitaka-yama. The last attains a height of 4,145 m. and is the highest peak on the island. Formerly it was named Mount Morrison, after an English captain. As the highest Japanese peak it was given its new name, which means 'new high mountain,' by the Emperor himself. The geological specimens brought back from the peak in 1896 by Lieutenant Saitō and Dr. Honda, who were the first to climb it, showed me that it, too, consists of the excellent black clay slate that forms the main ingredient of the Central Chain. A path leads from Chinran-kei, a lateral valley of the Dakusui-kei, over the eastern declivity of the Hattsūkan, to Bokusekikaku in the longitudinal valley east of the folded range.

Farther to the south there is another pass on the Pinan-shusan. This is 2,925 m. high, and the route from Ban-shoryō to Shinkaiyen leads over it. Chiponshu-san,

Gadōsan (2,760 m.), Mutō-san (2,912 m.) are other imposing peaks lying farther south in the chain. But then the highest place on the connecting mountain (Übergang) between Hōryō and Parōye is only 1,405 m. high. Here the island is only 30 km. broad, and to the south it becomes even narrower; at the same time the range sinks gradually towards the south, to the sea. The clay slate disappears and is covered with Tertiary layers, in which Riryū-san (1,224 m.) and Rōbutsu-san (693 m.) rise. The southern end of the island consists of a hilly, coral limestone landscape, in which the prominent mass of cliff Tai-seki-sen ("large stone point," 296 m. high) is well known.

9: Yamasaki--222-223 N-5 (1896-1897) 1900 Formosans-1-3
116, 133

With regard to geological structure, the deepest part of the main mountain chain of Taiwan consists of crystalline slate, stretching out in the form of a long, narrow zone at the eastern foot. Thanks to the geologist Dr. Ishii, who made a cross-cut through this zone on the Basshishō, we learn that the lowest layer of these archaic rocks consists of sericite schist. Over this is graphite chlorite schist, which is covered in its turn by chlorite schist. In addition actinolite schist and graphite schist are found as gravel. These stones must be classed among the Japanese "Sambagawa" layers.[223] Over them come the mightly layers of crystalline limestone and clay slate, which are held to be Paleozoic because of their petrographic nature, although so far no petrifications have been found in them.

The western side of the chain is not so steep as the eastern side, with the exception of the places where it is cut across by deep valleys such as the Dakusui-kei. The schist range gradually, by means of ever lower ridges, changes into a Tertiary range, and towards the west this in turn changes into a rather wide plain, whose coast is often bordered by dunes. This Tertiary range stretches from Bitō-kaku along the outer side of the main chain towards the south. The northern end of the chain is formed by the Tertiary mountainous region of Kilung, in the northern part of which the eruption of volcanic rocks occurred. It is divided into four mountain ridges by the three longitudinal valleys of the Kilung-kei and the two tributary streams of the Shinten. The height of the two middle subsidiary chains varies between 500m. and 800 m., while the peaks on

the southern subsidiary chain, which stretches west southwest from Sanshō-kaku often rise to over 800 m. When I arrived on the steamer in Kilung Harbor, my attention was first attracted by the curious formation of this young range. The surfaces of the declivities frequently coincide with the surfaces of the layers, and the shape of the mountains is very regular, resembling volumes that have been tilted and shoved next to each other. The chain continues to the southwest via Saiten-san, Sempitsu-san, Goshi-san or the Five Finger Mountain, so called because of its shape (1,044 m.), and Gyūkoki-san (1,575 m.) with a precipitous crag on to the well known Kali-san (2,142 m.). This last is an imposing mountain rising far above the ridge. The Tertiary Kali Range stretches farther to the south with projecting peaks 1,200 to 2,000 m. in height. The continuation of the range in the Taichū or Middle Taiwan is formed by the two high peaks of Shūshū-san (1,396 m.) and Tōkan-san (2,830 m.), which are separated from one another by the gap of the Dakusui-kei, the largest river on the island. The Tōkan-san probably forms a diorite island amidst these Tertiary formations* and is the highest

* For the rivers coming from the Tōkan-san contain diorite rubble.

peak of the Kali chain. Farther to the south the range stretches out to the delta region of the Tamsui-kei. Two tributary streams of the Tamsui-kei form longitudinal valleys along the chain.

Between this mountain range and the low-lying land is to be found the hilly Tertiary region. In the north the Tertiary mountains appear as the western preliminary chain of the Kali Range. It is separated from the main Kali chain by a long and narrow tectonic valley, bestrewn with many Chinese villages. The Kantō-san (831 m.) is the highest peak here. In Middle Taiwan these mountains are sometimes jagged and bare, as a result of strong erosion. The inhabitants of the plain generally call this hilly region and part of the Kali chain Zen-soan or "foreground mountains," and the old high chain Au-soan or "background mountains." Naturally the boundary is not precise.

The rocks found in this Tertiary layer are chiefly sandstone, clay shale and conglomerate, while limestone containing fossils is also found in some places in North Taiwan.

Various kinds of Tertiary sandstone are met with. That occurring in the Kilung Range is coarse-grained, rich in quartz and rather hard, for which reason it is much employed in North Taiwan as a building material. In it have been found Pecten, Arca, Ostrea, Yoldia, Xenophorus, Scalaria, Tellina, Echinoids and Asteclypeus. Orbitoides are also met with in the sandstone of the Gyūto-san on the Kōrō-kei.*

* The following comments have been made on the fossil remains in the limestone collection of Professor Kotō from Reisuikō, Shatokō and Shinbokai in North Taiwan by Messrs. R.B.Newton and R. Holland (The Journal of the Geological Society of Tokio, June 1900, Vol. VII; No. 81):

"The most surprising organism in these microscopic sections is the fossilized seaweed (Kalkalge) Lithothamnium (Dr. Yoshihara found this Lithothamnium limestone also on the island of Yayeyama in the south of the Riukiu group). It appears in large quantities in almost all specimens and is obviously identical with Lithothamnium (Cumulipora) Rosenbergii Martin, from the island of Timor, which is attributed to the Miocene period. The next species of importance is that which Dr. Kotō provisionally described as a species of Linderina. Together with Lithothamnium it forms the great bulk of the limestone cliff, but to classify it definitely is

difficult, on the basis of the specimens available. One of the microscopic sections does indeed seem to show the typical tubular structure of Linderina, and thus Dr. Kotō may indeed be correct in attributing it to this genus. Of the other foraminifera the following may be mentioned: Orbitoides (Lepidocyclina) Verbeeki, N. et H., Heterostegina (?), Miliolina, Gypsina, Textilaria, Pulvinulina, Micheliniana, Globigerina bulloides, Bigenerina, Valvulina (?)."

9: Yamasaki--223 [2] N-5 (1896-1897) 1900 Formosans
116, 133, 135, 314

It is worthy of note that the wealth of the island depends chiefly on the Tertiary mountains. The most important minerals, such as gold, soft coal and petroleum, are found here. The camphor trees also grow in this region, for the most part.

9: Yamasaki--223-224 N-5 (1896-1897) 1900 Formosans
116, 133

In the plain of South Taiwan we notice here and there some small hills, flattened, domed or tabular in shape, which are quite independent of the neighboring Tertiary hilly country. They are old coral reefs, whose geological period, Tertiary or Quaternary, has not yet been determined. Among them we have the Taikō-san (310 m.) Shōkō-san (240 m.), Hampei-san or Pwapen soan (228 m.), Atei-san (54 m.) and Hō-san or Foan-soan (147 m.). The Takao-san (323 m.) on the coast also belongs to this formation, and Shōryū-kyūtō or Lambay Island, which is about 10 km. from the mouth of the Tamsui-kei, also consists [224] of coral formations, so that it would appear that the hills mentioned are recently raised coral reefs.

9: Yamasaki--224 N-5 (1896-1897) 1900 Formosans
116, 133

The third range, which stretches along the eastern coast of Formosa—we have already called it the Tai-tō Chain or East Taiwan Chain—is also very worthy of note. The peaks in this range often rise to more than 1,000 m. The highest mountain , to the east of Kompo, attains a height of 1,550 m., while the next highest, to the southwest of Seikō wan, is 1,440 m. high. This chain also consists of sandstone, clay shale and limestone of the Tertiary period, and, in particular, its chief constituents are volcanic agglomera and tuffs. Above this stand some peaksof andesite lava. This agglomerate range is very steep everywhere, as is the rule in many other volcanic regions of Japan, and the detached blocks lying on the coast are often picturesque in appearance, as for example the giant sea-washed black cliffs in Sansendai, designated on maps as "Black Rock Bay." This range is doubtless a small volcanic range, which pushed through a break on the steep side of the central chain. It is thought that it was at first a volcanic island chain which was raised gradually by a secular movement until it became connected with the main island. And there are indeed many indications of this. Together with the tuffs, o top of each other, this agglomerate not only forms a massive complex of strata with the coral limestone beneath and the Tertiary sea sandstone, as can be clearly observed at the mouth of the Shūkoran-kei, but we also find a distinct terrace formation on this east coast, so that the precipitous coast rises in three or more steps. One also notices, on the northern side of the little bay of Sansendai, a coral reef 50 m. above the actual sea level. All these facts show us a tectonic uplift since the Tertiary period, which has not yet ceased.

In addition to this volcanic chain, [MC: Tai-tō chain or East Taiwan chain] there is another notable volcanic group in North Taiwan, which also pushed its way up through Tertiary layers. In consists of some volcanic cones, among which some prominent peaks are to be found, the Taiton-san and the Shichiseiton-san or Paulon-soan, and consequently we call this group "the Taiton volcanic group." It forms the northern frontier of the Taihoku Plain. To the southeast it is surrounded by Tertiary hills, while in the north its declivities stretch out gradually and gently to the sea. The Taiton-san (1,045 m.), which is in the middle of the group and on the right bank of the Tamsui-kei, is a volcano, doubly conical in shape, whose ejections lie for the most part to the north. At its western foot lies the harbor of Tamsui, also on these layers of tuff. The volcano is no longer active; but the thick layer and the considerable extent of the lava stream and other ejections, which can be clearly seen at the northeast crags, reveal marked activity in earlier times. Another high volcano, almost perfectly conical in shape, is the Shichiseiton-san or Paulon-soan, which is 1,109 m. high. It forms a blunted cone and has a crater on top, surrounded by some small peaks of the broken crater wall. This volcano is not inactive like the preceding; there are many solfataras around it. I saw three of them on the western slope and one at the eastern foot. One of them, situated on the northwestern slope quite close to the peak and the Kimpoli Pass, forms a large horseshoe-shaped depression, which was not inappropriately described by the

term "side crater," and from which steam and sulphur gases are expelled with a loud noise. To the south of this volcano we find another, not so high as the preceding, but quite conical in shape, which is called Sabō-san, i.e. the "Cap Mountain" (711 m.).

In the valley of Kōkei, between the three volcanoes described above, there is a large solfatara. It is situated exactly on the border between the volcano and the Tertiary hill whose slopes rise very steeply opposite the former and rather gently on the other side. Here we are doubtless confronted with a break in the Tertiary range through which the solfatara made its way. It has a considerable area, and many people work there gathering sulphur. Not far off there is a bog from which many hot sulphur springs rise. These springs flow out through a gulley and form a cheerful brook with some water-falls, and here a spa has been built. The surroundings of the Hokuto spa are very pleasant and attractive, and it is now the favorite recreation center for the citizens of the capital of Taihoku, who can reach it after a journey of one and one half hours.

9: Yamasaki--224 [4] N-5 (1896-1897) 1900 Formosans 116, 133

To the northeast of the Shichiseiton-san I saw another cone, the Kōshi-san (890 m.), which is probably an isolated volcano. I was told that there are two solfataras on its northern flank and a hot spring at the foot, near Kimpoli.

9: Yamasaki--224-225 N-5 (1896-1897) 1900 Formosans 116, 133

All these volcanoes are situated on the right side of the lower Tamsui-kei. Near the mouth of this river, opposite the harbor town of Tamsui, there rises up on the left hand side the isolated volcanic cone of Kannon-san. It is only 566 m. high, and its shape is not so complete that its crater can be made out exactly. The lava in all this volcanic region is only andesite, very similar to that on the [225] other Japanese islands. The lava of the Shichiseiton-san is a rather pumice-like, light brown amphibole andesite, while all the others consist of pyrozene andesite, with structures and colors that differ from each other, as is usually the case.

9: Yamasaki--225 N-5 (1896-1897) 1900 Formosans
116, 133

Older, unstratified rocks are very poorly represented on the island. Granite is almost unknown; but Dr. Ishii writes that a small piece of this rock was found by his colleague to the north of Karenkō. Granite, which is frequently used as a building material in towns of the interior as well as in many harbors, is imported from China. Serpentine was found in some small areas in East Taiwan. Diorite gravel was collected on the Taikokan-kei (upper course of the Tamsui-kei) and also on some tributaries on the left side of the Dakusui-kei.

Quite a number of hot springs have been found in different parts of the island, and not only in volcanic regions. They are indicated on the map (Plate 19). [MC: see source, page 298, plate 19, for map]

9: Yamasaki--225 [2] N-5 (1896-1897) 1900 Formosans 116, 133

The large plain of Taiwan forms the western part of the island. The alluvial soil is fertile and there are many towns and villages in all quarters of the plain. With regard to situation and nature we must separate the narrow northern part of this coastal land from the southern. The former is a plateau and consists in the main of rubble, clay and laterite. On the east coast we have also seen its origin, on one occasion, by the direct alteration of clay slate.

9: Yamasaki--225 [3] N-5 (1896-1897) 1900 Formosans 116, 133

A remarkable terraced table-land joins the northern plateau on the south and stretches in the direction of the meridian, from about 60 kilometers' distance from the Taikō-kei, to the Dakusui-kei. On its western side the table-land rises rapidly over the plain to between 200 and 500 m., while on the eastern side there is a much lesser and a gradual decline to the foot of the Tertiary hills. From east to west it thus has a long, cuneiform profile, and it consists of an extremely plentiful Pleistocene deposition of gravel, which is covered by laterite. I consider it to be the old coastal terrace. The tributaries of the Taito-kei flow through this territory [MC: the terraced tableland in the south] like a network. The soil is very fertile; but the town of Taichū (Taiwan-fu) situated here is notorious for malaria.

9: Yamasaki--225 [4] N-5 (1896-1897) 1900 Formosans
116, 133, 361

The middle and southern parts of the western coastal territory of Taiwan begin at the lower course of the Hōri-kei and stretch to the little town of Hōryō towards the south. The whole length of this plain is 220 km, and its greatest width is 48 km. It is heavily populated and has many towns, e.g. Kagi (Kia-ji), Taikō (Taikia), Unrin (Jünlin), Shōka (Tschang-hwu), Rokkō (Lokiang), Tainan (Tainanfu), Hōzan (Föng-schan), Takao (Takau), etc. In the north there is the small basin-shaped plain of Taihoku, watered by the Tamsui-kei and its tributaries. The capital of Taihoku (Taipei), with its commercial suburbs of Taitōtei (Tautuatea) to the north and Banka to the southwest, lies in the middle of the plain. There is also a small plain with the little town of Kōshun (Höngschön) at the southern end of the island.

9: Yamasaki--225 [5] N-5 (1896-1897) 1900 Formosans
116, 133

On the east coast we first find the so-called Capsiulan Plain in the neighborhood of the town of Giran (Ilan). Between the central shale range and the volcanic coastal chain the longitudinal valley already mentioned forms a narrow, long plain, which widens out in the north to form the plain of Kirai and in the south to form that of Pinan. Lengthwise, it stretches from Shinjō to Chipon.

9: Yamasaki--225 [6] N-5 (1896-1897) 1900 Formosans
116, 162, 361, 563

The Capsiulan plain is naturally not so heavily populated as the western plain, yet on its fields and meadows the more cultivated Amis, a branch of the Malayan race, enjoy an unclouded existence.

Finally, mention will be made here of an interesting depression in the middle of the island, where the 121st meridian crosses the 21st parallel. Through it flows the upper course of the Hokkō-kei, a tributary on the left bank of the Taito-kei. Probably it was formerly a lake basin. We shall name it the Horisha Basin, after the little town of Horisha situated there. To the south of this, in a wonderful landscape, lies the largest inland lake on Taiwan, called Suisha-ko, and for a long time past known to Europeans as "Dragon Lake." On the eastern shore there rises the thickly wooded Suisha-san, 1896 m. high.

9: Yamasaki--225-226 N-5 (1896-1897) 1900 Formosans-1-2
116, 133, 503

Let us now cast a glance at the island's coasts. Taiwan is but little indented and consequently, in comparison with other parts of Japan, it has a modest circumference. For every 1 km. of coast in Taiwan there are 29.5 sq. km. of area (almost as much as in the case of the chief Japanese island, where the relationship is 1 km. to 29.7 sq. km.), while in Kiūshū, which is almost as large as Taiwan, there is a surface area of 10.8 sq. km. only for every one kilometer of coast. In order to consider the coast in a convenient way, we shall first travel from Kilung Harbor along the east coast, then round the southern cape and along the west coast back to the point of departure. The harbor of Kilung lies at the northern end of the island and is the most important for intercourse and trade between Taiwan and the rest of Japan. The harbor bay (Ria) of Kilung is surrounded by Tertiary sandstone hills, and the shore shows many curious small erosional formations, comparable to [226] earth pyramids, which are also formed by the ocean waves, for example the large cave near Image Point.* The harbor is about 3 km. long

*The name "Image Point was given it by an American voyager with the Perry expedition, because of the shape of the earth columns.

and is more than 18 m. deep in the middle. Here at least ten large ships of over 1,000 tons can lie unhampered. But, on the other hand, only small craft, and that only at high tide, can go on to the slimy bottom of the inner part, for at ebb tide this is

uncovered. Unfortunately the mouth of the harbor opens too widely towards the ocean in the north, and is thus not protected against the rolling sea waves, particularly at the time of the northeast monsoon. Apart from this, Kilung is the best harbor on the island, and a project for its improvement has already been submitted to the Government, great hopes being placed on the plan's execution.

9: Yamasaki--226 N-5 (1896-1897) 1900 Formosans
116, 133

A precipitous coast extends from Kilung round the Sanshō Cape as far as the Kapsiu-lan Plain. But along the plain there stretch dunes which prevent the river waters entering the sea directly. So one can find a river which flows along the inside of the dunes and parallel to them. At the southern end of this stretch there is the small, but deep, bay of Soō (Suao). It is the only good recess on the island's east coast, for in time of storm three or four large steamers can lie quietly at anchor here. Between this harbor and Shinjō, in the Karai Plain, there rise giant crags to a height of more than 1,000 m. ...The shore of the Kirai Plain is also bordered by dunes, and here is situated the harbor of Karenkō or Hōrenkan, which is quite open to the sea and offers no protection from the high waves; even in fine weather it is not easy to enter this harbor. I myself waited in vain for two weeks for a steamer to take me back because of bad weather.

9: Yamasaki--226 [2] N-5 (1896-1897) 1900 Formosans
116, 133, 361

Southwards from Karenkō to Pinan along the foot of the coastal chain, the coastline first proceeds for a few kilometers along the first low hills; then there follows a steep stretch near Kororan, and again a low section with a steep edge lying farther back. The precipitous coast is wonderfully developed between the mouth of the Shūkoran-kei and Pinan. But at times we go through sandy beaches at the foot of the terraces, which are only a few meters high. There are three steps in the coastal terraces, with a total breadth of 300 to 1,000 m., and on this are found the villages and fields of the natives and also of the Chinese who have settled there. Many coral reefs can be seen on the shore.

9: Yamasaki--226 [3] N-5 (1896-1897) 1900 Formosans
116, 133

Seikōwan or Chokonwo is a small haven for small ships and fishing boats only, on the Sansendai Bay. It is quite round, with an average diameter of about 200 m., and is surrounded on all sides by coral reefs. Only a narrow exit to the sea permits sea traffic. On the dunes of the Pinan plain there is a large village of the same name. This is the chief locality of the Taitō or of East Taiwan. As for the value of the harbor, it does not differ greatly from that of Karenkō. From the end of the plain to Hachiyōwan, there then lies a far-stretching beach with a steep border. But one always proceeds along a narrow and unpleasant terrain covered with sand and gravel. At times we could walk along the coast only in the short interval between two consecutive waves. Here and there in between, clay slate cliffs sometimes project boldly into the sea. In some instances we had to clamber over the large pieces of rock that had fallen down from the slopes. The southernmost parts of the island consist of hills formed by coral limestone of the Tertiary period (?), and the coast itself is here and there bordered by new corals.

9: Yamasaki--226 [4] N-5 (1896-1897) 1900 Formosans
116, 133

The southernmost point of Garampi and another point called Guswa enclose the bay of Nanwan or Kwaliang. On the west coast of the small Koshun Plain lies the not exactly good but well-known harbor of Sharyō (Shajō). From there to the village of Hōryō one again finds a long beach with a precipitous edge, which gradually flattens out to form a level coast, then stretching out almost the whole length of the island's west coast.

9: Yamasaki--226-227 N-5 (1896-1897) 1900 Formosans
116, 133, 361, 503

When we proceed northwards from Hōryō, we find a harbor, Tōkō, at the mouth of the Tamsui-kei, a large river in southern Taiwan with a fertile basin. In the harbor, at least twenty large Chinese trading vessels always lie at anchor. Not very far to the north is a lagoon harbor, Takao, which is very famous, both because of its trade and also for the beauty and salubriousness of its location. Between the lagoon and the sea there stretches out a 12 km. long tongue of land, called Haisa ("sea sand"), on which are many fishermen's huts. At the northern end of the Haisa there rises up a crag, called Saracen's Head by the English, which was doubtless separated from the "Ape Mountain" opposite it by erosion of the sea waves. The Ape Mountain is joined by the higher Takao-san (327 m.), which is an important landmark for travelers. A narrow channel between these two hills forms the mouth of the bay and the harbor. Unfortunately the entrance to the lagoon, like the lagoon itself, is shallow so that only small steamers and junks can enter, while the [227] larger ships must anchor outside the harbor. All official buildings and foreign concessions lie beneath the Ape Mountain, while the shops of the natives are grouped opposite, at the foot of the Saracen's Head. This locality is usually called Kigo. Many mangrove trees can be found in the lagoon. They are not so large as those I later saw in Singapore. At some distance from the lagoon shore is the town of Hozan (Föngschan), in much the same position as Königsberg on the Danzig Haff. The two hills mentioned, Ape Mountain and Saracen's Head, consist of old coral reefs.

9: Yamasaki--227 N-5 (1896-1897) 1900 Formosans
116, 133, 501

Farther to the north [MC: of Takao] the level coast has many dunes. The large town of Tainan also stands on an old dune. The sea bottom of the corresponding harbor, Anping, is not deep, as is usual in this region, so that wide stretches of the coast are dry at low tide. The large ships anchor 4 km. distant from the wharf and the bamboo rafts peculiar to South Taiwan, and called Katamaran or Teppai, provide for communication between the ships and the land. In addition, the harbor is quite open to the sea: consequently all landing is sometimes suspended at the time of the southwest monsoon. But since, nevertheless, it lies in the neighborhood of the large town and the fertile plain, its commerce has come to occupy the first place in southern Taiwan. This region was known to Europeans from early times.

9: Yamasaki--227 [2] N-5 (1896-1897) 1900 Formosans
116, 175

The Dutch, who at the beginning of the 17th century founded their commercial rule in the East Indian Islands, also traveled farther north to Taiwan. There they built two strongholds, Zeelandia in 1630 and Providentia in 1650. There remains can still be seen in the town of Tainan.

9: Yamasaki--227 [3] N-5 (1896-1897) 1900 Formosans
116, 133, 503

I have already referred to phenomena of elevation on the east coast; they are also to be seen on the west coast. Not only the presence of many old coral reefs and dunes in the Tainan plain, but other facts also offer proof of tectonic movement in quite recent times. On old Chinese maps we see that the harbor of Anping, which is now connected with the town of Tainan by a piece of level land, was situated on a small island almost until the beginning of the 18th century. It is also said that the Dutch ships, earlier, in the 17th century, lay to at the town wall of Tainan. This wall is now at least 8 km. from the actual anchorage.

There are many other harbors on the long sandy and slimy coast of western Taiwan. They are all unprotected against the southwest monsoon and offer an unsafe anchorage. But Rokkō (Lokiang) in particular is the trading center in the Taichū Plain, for it is nearer than other harbors to the Asiatic continent, and there are piled up in bulk the products of the blessed Taichū Plain. To the northwest of Tonshō one can sometimes see the low edges of Tertiary hills and of even more recent formations on the strand. The northwest coast shows a great development of the dunes. Farther to the north, at the mouth of the Tamsui-kei, there is the famous harbor of Tamsui or, in Chinese, Hobe. Unfortunately the harbor is not good, on account of the many sandbanks which are quite dry at low tide. But since the river basin is an excellent production center for tea and the capital, Taihoku, also lies only 20 km. distant from the river mouth, trade and intercourse with many Chinese ports are in full bloom, particularly with Amoy and Futschu. On the coast we also notice coral reefs, which some people use for lime-burning. Northeastwards from Tamsui stretch out the gradual slopes of the Taiton volcanic group, with low cliffs at the end. Passing round the northern point, which is called Fuki-kaku or Foki, we come to Kilung along the strand which has steep edges lying farther back, this having been our starting point.

9: Yamasaki--227 [5] N-5 (1896-1897) 1900 Formosans 116, 133

The main watershed, beyond any doubt, is the central meridian chain, on whose two declivities the streams flow east and west. Most rivers, as on the other Japanese islands, are unsuited for shipping, the grade being too steep. Only two are suited for water transport, both of these bearing the name of Tamsui-kei ("freshwater river"); one is in southern Taiwan and the other in the north. The northern Tamsui-kei arises from the union of the Taikokan-kei with the Shinten-kei at Taihoku; the headwater regions of these two rivers lie in the mountains to the north of lat. N. 24° 30′ and west of long. E. 121° 30′, but are not known in greater detail. The Saiten-san separates the upper courses of the two rivers, these being also little known, that of the Taikokan pointing to the north and the other to the northeast. The first should be looked on as the main river.

9: Yamasaki--227-228 N-5 (1896-1897) 1900 Formosans
116, 133, 312, 505

The Tamsui-kei, which together with its two tributaries on the right-hand side, the Shinten and Kilung, flows through the fertile plain of Taihoku, is important not only for watering the fields but also in communications. At its mouth lies the harbor of Tamsui, already mentioned. From there there always travel many Chinese ships and river steamers 20 km. farther up the river to Tai-tō-tei (Tautuatea), which is the largest freshwater port of Taiwan and is quite close to the capital of Taihoku. The trading vessels [228] can travel another 20 km. to the southeast as far as Taikokan (Takoham), a small town on the border of the native territory. The surroundings of the town of Taikokan are well known for camphor and other forest products. So one can always see many small boats with these products traveling from there to Taitotei on the swift flowing Taikokan-kei. The largest tributary of Tamsui-kei is the Kilung-kei. It flows through a longitudinal valley in the Tertiary range of Sanshōrei, a famous battlefield and a difficult mountain pass. It is about 60 km. long and navigable over most of its extent. Along the upper course of the Tamsui-kei river there are gold fields and bituminous coal deposits. The port of Kilung also lies quite close to the side of a small hill on the river. Thus this small but voluminous river also has considerable importance for transport in this region, where the roads leading into the country are in a bad condition.

9: Yamasaki--228 N-5 (1896-1897) 1900 Formosans
116, 133

The Tamsui-kei of South Taiwan flows from the Central chain in a southern direction, through a large fertile plain on which rice and sugar-cane grow, to Tōkō, a port at its mouth. Small boats can travel pretty far up the river. Some smaller rivers in the southern plain and in the marshy region are navigable, but they have little importance in transportation.

9; Yamasaki--228 [2] N-5 (1896-1897) 1900 Formosans
116, 133

The drainage channels on either side of the Central chain have their peculiarities, owing to the topographical conditions. The waters from the huge steep declivities of the eastern side form numerous but short transverse valleys. In the middle part of eastern Taiwan all the waters of these transverse valleys cannot flow directly through the meridian chain lying on the coast, but turn into the longitudinal valley between the two chains at a right-angle to north or south. The whole narrow Taitō Plain offers passage to these waters. The whole length of the plain is watered by three rivers flowing in opposite directions, their watersheds being only 200 m. above sea level. The river in the north is called Karenkō and the southern river Pinan, both of them having rather a large meadow plain at their mouths. The third, Shūkoran-kei by name, which is also the largest river in eastern Taiwan, has its source in the highest part of the Central chain. Like the Karenkō, it turns northwards into the Taitō Plain, flows along it for some distance and then breaks through the coastal range at Tsuibi and flows eastwards to the sea. The volume of water in this river is usually so small that the natives can drive their large buffalo carts right through the water. Only in the lower course of the Shūkoran-kei is some deep water to be found, on which there travel to and fro the curious little boats that can be carried on land by one adult. The river bottom is always covered by pebbles, with the sole exception of some streams on the northeast coast. The water is generally clear and flows swiftly.

9: Yamasaki--228 [3] N-5 (1896-1897) 1900 Formosans 116, 133

On the western side of the Central chain we notice that almost all the rivers reveal the peculiarity that the waters they have collected in their upper courses divide again after they enter the coastal plain and make their way to the sea in different branches. Thus we always find that the delta at the mouth of these rivers occupies a considerable extent of ground. The water level in these branches is usually very low and the whole area between them is covered with coarse gravel, which makes it very unpleasant for the traveler on the main routes there. In the rainy season, when streams rapidly swell into rivers, these beds frequently change, thus creating a great obstacle for intercourse between North and South Taiwan. The Hōri-kei, whose whole course is about 100 km. in length, has a gravelly area 10 km. wide on its lower course, and a much larger one at the mouth.

9: Yamasaki--228 [4] N-5 (1896-1897) 1900 Formosans
116, 103, 133

The largest river, the Dakusui-kei, has its source in a gorge on the southwestern slope of the Setsu-san (Mount Sylvia). Its clear, burbling water forms in the upper course, a longitudinal valley between the chains in front of and behind the highest range. Approximately in the middle of the island it turns west at a right-angle to its upper course. On the two steep sides of these transverse valleys one can find frequently landslides and falls of rock. Here the water, mixed with the fine particles of clay slate and schist, is very dark, so that the Chinese gave the river the name of Dakui-kei or "clouded water river." The dark grey, foaming water flows farther west to the neighborhood of Linkiho where the tributary of Seisui-kei, or "clear water river" flows in on the left. From there it suddenly spreads out over the level plain of central Taiwan and forms a complicated, fan-shaped network of branches, of which the Seira-kei is the most important, continuing in a westerly direction to the sea. The distance between the northernmost and southernmost mouths is estimated to be about 40 km. This is certainly a very curious phenomenon on such an island as Taiwan.

9: Yamasaki--228-229 N-5 (1896-1897) 1900 Formosans 116, 133

Terrace formations are very widespread on the island, and it can often be seen how they originate along rivers. Along the Taikō-kei in the Taichū Plain I noticed four steps, while Dr. Inonye has written about the five-stepped terrace on the Nan-a-kei in southern Taiwan. Imposing layers of gravel are found everywhere on the plateau, proving that [229] in previous times the flowing water had an even stronger effect than today.

9: Yamasaki--229 N-5 (1896-1897) 1900 Formosans
116, 131, 133, 361 Pescadores

Apart from the chief island of Taiwan, there are various subsidiary islands. Among these the Pescadores are the most important. This group consists of about eighty islets and cliffs, situated to the west of Taiwan in the Formosa Channel, between lat. N. 23° and 24°. The Portuguese called these islands Pescadores (Fisher Islands) because of the extensive fishing which the Chinese have practised there for many centuries. The largest island is called Hōkō-tō (Penghu Island). It consists of basalt and coral reefs. On its western side a bay is formed by the two islands next in importance, Hakusa-tō (Pehoe Island), or "white sand island" and Gyo-ō-tō (Fisher Island). This protected area offers an important haven in the stormy China Sea. The chief locality on the largest island, Makō or Mekon, is a small harbor on this bay with about 3,000 inhabitants, to which there must now be added a small Japanese garrison. The harbor is deep and quiet; always to be found there are some steamers and Chinese trading junks, together with a large number of fishing boats. The island is flat and poor in flora. The highest elevation is only 48 m. high. Other islands worthy of note in this group are Kitsubai or "Bird Island" to the north and the Pachan (Rover) group with Pachan and Tsiang, the Kitsu group (East group) with Tōkitsu and Saikitsu and Taisho or "Junk Island" in the south.

9: Yamasaki--229 [2] N-5 (1896-1897) 1900 Formosans
116, 131, 133

To the southwest of Taiwan lies the small coral island of Shō-ryū-kyū-tō or Lambay Island, while to the east of Taiwan the three volcanic islands of Kashō-tō or Samasana, Kōtō-sho or Botel-Tobago and Sho-kōtō-to or Small Botel-Tobago are also counted with Taiwan. Kisho or "steep island," is a small island on the coast of the Kapsiulan Plain. At the mouth of the port of Kilung there are two islands, Sai-rō-to and Kilung-tō; the latter, consisting of volcanic rock, rises steeply from the sea. Farther to the north lie Agincourt and two other islets.

9: Yamasaki--229 [3] N-5 (1896-1897) 1900 Formosans
116, 132, 654

Like the scientific investigation of Taiwan in general, the systematic examination of the climate also does not begin until the establishment of Japanese rule. In 1897 five meteorological stations were set up, in Taihoku, Taichū, Tainan, Kōshun and Hōko-tō. The organization of simultaneous and corresponding observations in these and other Japanese stations, as also in China and Korea, undoubtedly effected a new advance in East Asiatic climatology. Very carefully observed is the cyclone, which frequently every summer or fall begins in the neighborhood of Taiwan and gradually proceeds north to Japan, and in the regions it touches, precautionary measures are adopted, depending on the weather prospects.

9: Yamasaki--229 [4] N-5 (1896-1897) 1900 Formosans
116, 132

In the southern part of Taiwan there is naturally found, in view of its latitude, a tropical and sub-tropical climate. Apart from the geographic position, the climate of the island is determined chiefly by the influences of the warm Kurosiwo and the high mountain range, which runs along the whole island from north to south. In summer the temperature rises to 37° in Tainan, while in winter there is frost in the mountainous region and sometimes snow in North Taiwan. Heavy precipitations in North Taiwan and strong wind in Hōko-tō are peculiarities worthy of note. The material found in the following descriptions is taken chiefly from our recent observations.

9: Yamasaki--229-230 N-5 (1896-1897) 1900 Formosans-1-3
116, 132

Temperature. The following summary gives the average figures found in the five observation posts in 1897 and 1898.

	Average Temperature (Centigrade)				
	Taihoku	Taichu	Tainan	Kōshun	Hōkotō
January	16.2	16.5	18.2	21.3	16.3
February	14.7	15.6	17.7	21.1	15.8
March	17.9	18.9	20.5	23.5	18.2
April	19.3	21.1	23.0	24.9	21.3
May	25.1	26.9	27.6	27.5	25.9
June	26.4	26.8	27.5	27.0	27.1
July	27.8	27.1	27.8	27.3	27.7
August	27.3	26.7	27.4	26.9	27.2
September	26.5	26.7	27.9	27.0	27.4
October	23.4	24.3	25.4	25.8	24.7
November	20.5	20.9	21.8	23.5	21.6
December	16.0	16.5	17.9	21.0	17.5
Average	21.7	22.3	23.6	24.7	22.6

9: Yamasaki--229-230 N-5 (1896-1897) 1900 Formosans-2
116, 132

Average Maximum Temperature.

January	20.0	21.3	25.2	24.6	19.6
February	17.6	19.9	24.8	24.5	18.4
March	21.7	23.6	27.0	27.1	20.8
April	22.9	25.5	28.9	28.4	23.8
May	29.6	30.7	32.4	31.4	28.6
June	30.6	30.7	31.5	29.5	29.7
July	32.7	31.4	32.3	30.3	30.1
August	31.5	30.7	31.1	29.5	29.6
September	31.0	31.3	32.9	30.6	30.7
October	26.8	29.0	30.7	28.4	27.3
November	23.3	25.8	27.1	25.8	23.7
December	19.5	22.2	24.6	23.5	19.7
Average	25.6	26.8	29.0	27.8	25.2

9: Yamasaki--229-230 N-5 (1896-1897) 1900 Formosans, 3
116, 132

[230] Average Minimum Temperature.

January	13.6	13.1	13.9	18.3	14.9
February	12.2	12.7	13.5	18.2	13.8
March	15.3	15.9	16.2	20.7	16.0
April	16.6	17.8	18.8	22.0	19.0
May	21.6	22.7	23.6	24.2	23.6
June	23.2	23.8	24.6	24.7	25.0
July	24.1	23.5	24.3	24.5	25.4
August	24.3	23.7	24.4	24.7	24.9
September	23.3	23.4	24.2	24.2	25.5
October	21.0	21.1	21.9	23.6	23.1
November	18.7	17.6	18.4	21.4	20.1
December	13.4	12.4	13.6	18.6	16.0
Average	18.9	19.0	19.8	22.1	20.6

9: Yamasaki--230 N-5 (1896-1897) 1900 Formosans
116, 132

The coldest month is February; only Kōshun can show an average temperature of 21.0° in December as compared with 21.1° in February. The average minimum is always found in February in all stations, and the absolute minimum temperature is 3.3° in Taihoku, 3.2° in Taichū, 3.5° in Tainan, 11.8° in Kōshun and 9.9° in Hōko-tō. The warmest month is July all over the island; but the maximum temperature is not limited to this month. In Taihoku and Taichū the average maximum temperature falls in July and at other stations in September. The maximum temperature varies between May and September. It rises to 34.6° in Taichū in May, 36.9° and 36.5° in Taihoku and Tainan, 33.4° in Kōshun in July, 33.5° in Hōkotō in September. The variation of temperature is greater in the north than in the south. In Taihoku the difference between maximum and minimum amounts to 33.2°, while in Kōshun it amounts only to 21.6°, where the lowest temperature in winter does not fall below 10°. The amplitude is also greater in winter than in summer. Taihoku can show the minimum temperature of only 3.5° in February, while the maximum in the same month is 31.3°.

9: Yamasaki--230 [2] N-5 (1896-1897) 1900 Formosans
116, 132

Barometric pressure and winds. The barometer reading is high in December and January and low in June, July and August. In winter, the pressure is higher in the north than in the south, while in the summer it is higher in the east than in the west. Observations reduced to sea level and 0° c., gave the following results.

	Average Barometric Pressure in:				
	Taihoku	Taichu	Tainan	Kōshun	Hōkotō
January	766.3	763.4	765.6	763.1	764.0
February	63.6	61.7	61.6	61.3	62.2
March	62.2	60.9	60.8	60.6	61.2
April	61.5	60.0	59.7	59.8	60.3
May	57.3	56.9	56.9	57.3	57.1
June	53.6	53.5	53.5	54.2	53.6
July	56.0	55.9	55.9	56.5	55.9
August	53.4	53.5	53.8	54.6	53.6
September	57.4	56.5	56.4	57.0	56.7
October	60.1	58.0	58.8	58.2	58.5
November	62.3	59.7	59.7	59.5	60.3
December	66.0	63.4	63.4	62.9	64.0
Average	759.9	758.6	758.6	758.8	758.9

9: Yamasaki--230 [3] N-5 (1896-1897) 1900 Formosans
116, 132

Since the island lies in the monsoon region, the wind is very regular. From September to April north and east winds predominate. The direction of the wind varies in every station as a result of the topographical conditions. Thus we have east wind in Taihoku, north wind in Taichū and Tainan and northeast wind in Hōkotō and Kōshun. Between May and September the direction of the wind is rather irregular in every station, but the south wind predominates. In Hōko-tō, an isolated level island in the open sea, the direction of the wind is very regular and always changes from NNE to SW during a year. The average velocity of the wind varies between 2.9 m. per second in Taichū and 11.1 m. in Hōko-tō. The northeast monsoon is much stronger than the southwest monsoon, and in Hōko-tō we have always a strong wind, 10 m. per second during the period of the northeast monsoon. The strongest wind so far observed is that of September 30, 1898, in Hōko-tō, which had a velocity of 56.4 m. per second. The frightful cyclone or typhoon which springs up two or three times every year in the China Sea often begins to the east of Taiwan or the Philippines region and travels north along the east coast of Taiwan, with its centers about 2 degrees distant from the coast.

9: Yamasaki--230 [4] N-5 (1896-1897) 1900 Formosans 116, 132

Humidity and Precipitation. The latitude of Taiwan in itself is sufficient to raise expectations of great humidity. The monthly average is over 80%, and varies between 93% and 73%. On the driest days the humidity is only 31%. In winter it is greater in the north and less in the south, while in summer the opposite holds.

9: Yamasaki--230-231 N-5 (1896-1897) 1900 Formosans 116, 132

The time and the amount of precipitation on Taiwan are very remarkable. The northeast monsoons of the winter, which blow over the warm current, the Kurosiwo, bringing with them much moisture, strike against the high mountains of northern Taiwan and fall down again on their northeast side. Consequently we have a rainy season in northern Taiwan during this monsoon. It is said that the precipitation in this region is the heaviest in the northeast monsoon region, and especially in Kilung, a port at the foot of the mountains on the island's north coast, it attained a height of 5238.4 mm. in 1898. An interesting view is obtained when one sees from a distance, on the western side of the Central chain, the thick layers of cloud which rise from the east to the mountain crest but then move on only a little farther, since the warmer...air on the western side dissipates them again. The phenomenon resembles that of the "tablecloth " of the Table Mountain, in South Africa. In Taihoku, [231] which is on the other side of the range and is only 40 km. distant from Kilung, the precipitation is less than half as heavy as in the latter locality.

When the southwest monsoon has begun, the southwestern part of the island has heavier precipitation than the northeast. Tropical storms often occur, and the rainfall during them often attains considerable proportions. Thus Kōshun, during June, 1897, had 1,535.7 mm. But this was probably a rare exception. The whole western side of the island, as the following summary shows, received by far the heaviest precipitation during the summer, the maximum being in August.

9: Yamasaki--231 N-5 (1896-1897) 1900 Formosans
116, 132

	Average Rainfall				
January	71.7	35.8	9.5	10.9	11.3
February	207.0	159.9	132.8	83.0	78.6
March	71.1	43.2	36.6	48;0	21.4
April	156.3	82.9	43.9	16.5	54.5
May	184.2	96.8	53.6	46.9	46.8
June	229.0	475.0	535.5	1345.7	155.3
July	178.5	296.8	206.6	239.9	203.9
August	690.0	866.5	676.9	482.1	549.5
September	273.3	96.5	54.4	129.6	17.0
October	179.0	18.7	56.6	241.6	55.1
November	114.9	20.8	34.6	154.0	43.5
December	80.3	8.6	3.8	13.8	3.0
Whole year	2435.6	2201.7	1835.0	2911.8	1240.2

9: Yamasaki--231 [2] N-5 (1896-1897) 1900 Formosans
116, 132

According to the observations conducted over a period of five years by A. Hosie, the English consul in Tamsui, the average rainfall in this port amounted to 1,927 mm.*

* Alex. Hosie, Report on the Island of Formosa, presented to both Houses of Parliament, 1893, p.6.

9: Yamasaki--231 [3] N-5 (1896-1897) 1900 Formosans
116, 137,. 313, 342, 501

As the name of Formosa shows, we find all over the island very heavy tropical vegetation.

.Bamboo. This grows everywhere on inhabited plains and hills. The useful species become much thicker and larger than in Japan. It is used for many purposes. In the mountains the inhabitants build their huts of it, and in South Taiwan the fishermen build of it their boats and Teppai or Takamalan. These latter are curious sailing boats with raft-like bottoms of bamboo stems laid beside each other.

9:. Yamasaki--231 [4] N-5 (1896-1897) 1900 Formosans
116, 137, 276

The betel-nut palm (Areca Catechu L.) is a common tree in the plains. Especially in South Taiwan it is planted in gardens. Slices of the fruit mixed with slaked lime and leaves of the betel-pepper are used on Taiwan, by both Malays and Chinese, as a stimulus and offer an agreeable refreshment, when placed in the mouth.

Ficus retusa L. and Ficus Wightiana Wall, are also found extensively on the island. In one pass between Teroso and Hachiyowan in South Taiwan I saw a dense wood of Ficus retusa, together with Calamus Rotang L., much intertwined. The first mentioned species of fig, with its far-spread aerial roots, also grows much on the tongue of land near Takao. Pan dangs (Pandanus odoratissima) is found extensively in the plain, particularly in the region of the coast. The tree fern (Cyathea spinulosa) is also found all over the island. The coniferous type of tree ends in North Taiwan. Here, as far as the Hachimantōge on the Hokkō-kei, there are still found beautiful woods of a pine very similar to the Japanese Pinus densiflora. One often encounters Acacia Rhichii in the woods and fields and along the routes. At first glance, from a little distance, it looks like an osier. The coral tree (Erythrina indica L.) flourishes in the plains. In general the primeval forests in the mountain ranges of Taiwan are very dense and impenetrable. Most trees are covered by uncountable varieties of parasites and various climbing plants wind around them. Where there are no trees there is a brush consisting of bamboo, banana palms or tree ferns. In clear patches, there are grass bushes of Kaya (Eulalia and Imperata species) over 3 m. high, which are often so thick that it is difficult to traverse them. In lagoons near Takao one finds the mangrove woods so typical of tropical regions.

9: Yamasaki--231 [6] N-5 (1896-1897) 1900 Formosans
116, 137

Concerning the flora of the woods, Dr. S. Honda, who climbed the highest mountain, Niitaka-yama, has made the following important observations:*

*Mitteilungen der deutschen Gesellschaft für Natur-und Völkerkunde Ostasiens in Tokio. Vol. VI, No. 60, July 1897.

"The Formosan lowland belongs, from sea level to a height of 1,700 feet (520 m.), to the area of tropical vegetation, and consists chiefly of Ficus, Pandanus, palms and pineapple. From here up to 6,000 feet (1,830 m.) there extends a sub-tropical evergreen forest, the camphor tree being found up to a height of 6,500 feet (1,980 m.); in addition we find evergreen oak species. From 6,000 feet (1,830 m.) there begins the coniferous region, first of all with Cryptomeria and Chamæcyparis and then, between 7,000 and 8,500 feet (2,130 to 2,590 m.), with pines (a variety of Picea Glehni), between 8,500 and 10,500 feet (2,590 to 3,200 m.) with Tsuga (Tsuga diversifolia Max.) and finally, from 10,500 feet up to the peak of the Morrison (3,200 to 4,145 m.) with species of fir and juniper, and chiefly Abies Menziezii."

9: Yamasaki--231-232 N-5 (1896-1897) 1900 Formosans
116, 243, 311

The most important species of cereal on the island is rice (Orysa sativa L.). In the plains as on [232] the gentle slopes of the hilly regions, the rice fields occupy a great area. The basins of the two Tamsui Rivers, the Kapsiulan Plain near Giran, and the Taichū Plain are its chief centers. In East Taiwan we also find small rice plantations, as far as Chinese colonists have penetrated. There are usually two harvests a year: in South Taiwan even three harvests are obtained from the same fields.

9: Yamasaki--232 N-5 (1896-1897) 1900 Formosans
116, 249, 439

The second chief product is sugar-cane. It is noteworthy that sugar-cane in Taiwan is much smaller than in the Riukiu Islands. It grows in large quantities in the plain of Tainan. November is the harvest month. The raw sugar is manufactured with the help of a primitive mill in large, cone-shaped huts, of which many can be seen in the southern plain. The most important centers of the export trade in sugar-cane are Takao and Tainan (Anping), the trade being very lively between January and April.

9: Yamasaki--232 [2] N-5 (1896-1897) 1900 Formosans
116, 245, 311.

While we have seen sugar in South Taiwan, we find many fields with tea plants in the northern part of the island. The surroundings of the Taihoku Basin yield most of this third most important island product. Tōshien Tableland and the two slopes of the Kilung Valley are covered in the main with these beautiful tea plantations. There are two kinds of Taiwan tea on the market, Oolong tea and Pauchong tea. They come from the same plants, the difference depending on the method of preparation. Oolong tea, which is usually made from the better leaves, is rather weaker in taste and odor than ordinary black tea, while the other is made aromatic by mixing it with flowers, such as jasmine (Matsuri). The leaves of the tea plant are harvested seven or eight times a year; but the best quality is obtained only from the second Spring harvest.

9: Yamasaki--232 [3] N-5 (1896-1897) 1900 Formosans
116, 245, 439

Taitōtei is the only town manufacturing and dealing in tea. The tea is exported via Tamsui to Amoy, and from there the Oolong tea goes in the main to America, in part to England also, and the Pauchong tea goes to the Straits Settlements for the Chinese w live there.

9: Yamasaki--232 [4] N-5 (1896-1897) 1900 Formosans
116, 244, 311

Sweet potatoes (Ipomea batatas Lam.) are one of the inhabitants' most important articles of diet for both the Chinese and the natives, and they are to be found growing on the island, wherever it is inhabited. In the mountain regions, as in Musha on the Dakusui-kei, which is inhabited by the wild aborigines, I have also seen fields of sweet potatoes on the rather steep slopes. There is also a double harvest in the western plain.

9: Yamasaki--232 [5] N-5 (1896-1897) 1900 Formosans
116, 243

In addition to the rice already mentioned, the species of cereals found are wheat, barley, millet and buckwheat (Fagopyrum esculentum M.).

9: Yamasaki--232 [6] N-5 (1896-1897) 1900 Formosans
116, 244, 264, 372

Also planted are various species of legumes and the peanut (Arachis hypogaea L.). Peanuts in part are eaten roasted, and in part are worked into cakes and made into oil, which is much used by the Chinese for cooking and illumination.

9: Yamasaki--232 [7] N-5 (1896-1897) 1900 Formosans 116, 137

Many species of edible fruits are found. Bananas (Musa chinensis) are found everywhere. Pineapple (Ananassa sativa Mill.), Euphoria longa, Mangifera, are tasty tropical fruits. Among the Citrus genus the large Citrus decumana L. (Yua) plays the chief part C. nobilis and C. medica being also found. I have seen persimmon (Diospyros kaki) in the aboriginal village of Hōgō in the Central chain.

9: Yamasaki--232 [8] N-5 (1896-1897) 1900 Formosans
116, 137, 248, 286

The pineapple (Hōri or Unrai) is an important plant for Taiwan, not only for its fruit, but also because the leaves have fine fibers from which thin summer clothing is woven. The fine cloth used for this is called Unrai-pu or "pineapple cloth." The most important textile plant of the island is, however, the China-grass (Boehmeria nivea Hook.), Tschumā in Chinese and Karamushi in Japanese, its fibers being exported in large quantities. It is also one of the chief articles of barter for the aborigines in the mountains. In Holisha I saw a large quantity of China-grass fibers, which had been taken there by the natives living on the upper course of the Dakusui-kei.

9: Yamasaki--232 [9] N-5 (1896-1897) 1900 Formosans
116, 137, 289

A curious and noteworthy plant growing on the island is the Fatsia papyri fera Miq. (Tsungtsau in Chinese and Tsūsō in Japanese). The Chinese cut out of the snow-white pith of Fatsia papyrifera Miq. thin strips like paper with such extraordinary skill that, from a cylindrical piece of pith about 3 cm. in diameter and 6 cm. long, they can make a strip about 5 m. long with one continuous cut starting from the surface and parallel to the axis. The dry strips of pith paper are then dyed various colors and worked into beautiful artificial flowers for the coiffure. To call this pith paper "rice paper" is no less wrong than to use the name "rice broom" or "root broom" for articles made from the panicles of the durra (sorghum vulgare).

9: Yamasaki--232-233 N-5 (1896-1897) 1900 Formosans 116, 137, 314

Camphor (Chang-nau or Nau in Chinese, Shōnō in Japanese) plays the most important part among the forest products, in fact the island is the largest provider of it. The camphor tree (Cinnamomum camphora Nees.) or, as one also says, the "king of the Formosan forests," is found in abundance in the luxuriant virgin forests of the northern half of the Kali chain and the neighboring regions of the Central Range, up to a height of 2,000 m. The trees attain an imposing height and sometimes, [233] with a diameter of 3 m., are between 40 and 50 m. high.

9: Yamasaki--233 N-5 (1896-1897) 1900 Formosans
116, 314

Here and there, on the border territories of the aborigines on the western slopes of the Central chain, there stretch out a number of devices for obtaining camphor, in which the Hakka, a hardy clan that formerly transferred themselves here from the province of Canton, prepare the raw camphor. The apparatus is very simple and not very well adapted to its purpose. Only the juicy roots and the lower pieces of the trunk are used, while the corona is thrown away.

9: Yamasaki--233 [2] N-5 (1896-1897) 1900 Formosans
116, 314, 655

The Japanese Government on the island has now made the camphor trade into a monopoly, like the obtaining of sea salt on the west coast.

9: Yamasaki--233 [3] N-5 (1896-1897) 1900 Formosans
116, 136

Our zoological knowledge of Taiwan is limited for the most part to the investigations of Swinhoe more than 30 years ago, for the Japanese accounts in this domain of natural history have not yet appeared. 31 species of mammals are known and about 150 bird species. The largest beast of prey is a black bear (Ursus Formosanus Sw.), which is close to the Japanese Kuma (Ursus Japonicus Schl.). In one village on the upper reaches of the Dakusui-kei I saw a chief wearing a cap made of the neck-piece of this bear. The fox (Canis vulpes) is also widespread, as in Japan. Flying foxes and bats, squirrels and other rodents are also found. In the woods there is a species of monkey (Innuus speciosus), and a species of wild boar (Sus taivanus) occur in large numbers. There are also many deer (Cervus Swinhoii), very similar to the Japanese Cervus sika, and also antelopes. The hides and antlers of the deer play a big part among the mountain dwellers as articles of barter. Of the tropical genus of the pangolin (Manis), the short-tailed Manis has been known for centuries.

9: Yamasaki--233 [4] N-5 (1896-1897) 1900 Formosans
116, 211, 262

The most important domestic animal is the buffalo (Bos chinensis). It pulls the plow, and its flesh, horns and hide are also esteemed. Ordinary cattle are also found, but horses are rare. Sheep seem to be lacking, but goats exist in fairly large numbers. The most frequent four-footed domestic animal, is however, as in China, the pig, its flesh being eaten gladly by both natives and Chinese. Generally liked and raised both for their eggs and their flesh are ducks, geese, and hens.

9: Yamasaki--233 [5] N-5 (1896-1897) 1900 Formosans
116, 136, 262

Fish naturally play an important part in the diet, especially among the dwellers on the coast. Among the many species of the Taiwan Sea that are favored, the Harder (Mugil cephalus) is to be named before all others. In the winter months the inhabitants of the southwest coast are kept very busy catching it. It is about 3/4 m. long and not only its flesh but also its milt provide an article of diet esteemed by both Chinese and Japanese. In the markets at Tainan and Takao I saw the following species of fish also: Pagrus sp., Peristethus orientalis, Trigon pastinaka, Tachiurus lepturus, Thynnus pelamys (bonito), Trachurus sp., various mackerels, flat-fish, squid, etc. Among freshwater fish Cyprinus carpio (carp), Cerassius auratus (crucian), a species of trout (Plecoglossus altivelis) and Anguilla bostmiensis (eel) are the most important. There are also various species of valuable crustaceans. The king crab (Limulus) is also found in the sea near Taiwan, close to Kilung, especially, and its shell, which is used for ladles, can be bought everywhere. On the southeast coast I have often seen large turtles and their old shells are also found on the shore.

9: Yamasaki--233 [6] N-5 (1896-1897) 1900 Formosans
116, 228

Many oysters are carefully raised on the southwest coast, particularly near Anping.

9: Yamasaki--233 [7] N-5 (1896-1897) 1900 Formosans 116, 135, 175

Important minerals found in Taiwan are gold, coal and sulphur. The chief sites are in North Taiwan, particularly in the surroundings of Kilung. Gold is found in two forms, as river-gold and in veins. It was first dound in Kilung-kei in 1890 by a Chinese workman who had formerly been in a Californian mine and who was occupied in constructing a railroad bridge over the river. From this time on, thousands of gold-washers have visited a long stretch of the Kilung-kei about 16 km. from its upper course at the Sanshōrei to the Shichito railroad bridge. Later gold deposits were also discovered in the mountains of Kyūfun-san and Kinkaseki, in the Zuihō region lying to the east of the port of Kilung. We learn through Dr. Ishii, the Taiwan Government geologist, that the metal is found in Kinkaseki in the zone of contact between Tertiary layers, in the main sandstone and slate, and the projecting volcanic rock, while in Kyūfun-san there are veins that are traversed by Tertiary layers. In addition gold-bearing sand was also found near Shinjō and in the Shūkoran-kei on the east coast.

9: Yamasaki--233-234 N-5 (1896-1897) 1900 Formosans 116, 135

There is a good deal of coal in the Tertiary Kilung mountainous region; but unfortunately its quality in general is not good. Many deposits can be seen on either side of the Kilung-kei. Denryōkō, Shikyakutei and Sanshōrei are the chief centers in this region, and here the quality of the coal is good compared with other places. There are three deposits in Shikyakutei, the thickest of which measures [234] 1.3 m. The Denryōkō deposits also consist of three beds, the thickest being 3 m.; but they gradually become narrower towards the west. To the north of this region are found the Nai and Gaihoku-san, the Kakyaku and Kimpoli deposits, among which the Kakyaku fields belonging to the Imperial Navy have four deposits, the thickest of these being about 1.7 m. The continuation of the northern layers stretches out farther to the west in Kilon, on the tableland of Tōshiyen, while continuations of the Sanshōrei layers can be found only near Shinten to the south of Taihoku. The coal-bearing layers are always Tertiary sandstone and slate, as in other regions of Japan, and their line of strike goes from the northeast to the southwest. There are anticlinal and synclinal layers, and their angle of descent is often very great, being as much as 85°.

9: Yamasaki--234 N-5 (1896-1897) 1900 Formosans
116, 135

Sulphur comes from various solfataras in the Taiton volcanic group,...For the most part it comes from the large solfataras of Hokutō (Patau), Dairyūkō on the western declivity of the Shichiseiton-san, and Taikōshi, to the south of Kimpoli. The other five solfataras also yield small quantities. The total production varies between 300,000 and 420,000 kilograms annually.

9: Yamasaki--234 [2] N-5 (1896-1897) 1900 Formosans
116, 135

Petroleum. It is known to occur in various places. In Gyūtōkō, 15 km. to the south-east of Byōritsu (Mioli), where the middle course of the Kōrō-kei forms a gorge through the chain of Tertiary layers, it appears on its bank. Formerly 36 kilograms were obtained here every day. In addition it is found in two wells in South Taiwan, near Kōnaishō and Hōryō, 12 km. to the north of Banshoryō.

9: Yamasaki--234 [3] N-5 (1896-1897) 1900 Formosans
116, 439, 652

The total national income (Erträge) of Taiwan is estimated at over 40,000,000 yen per year. Of this, the total value of goods exported in 1896 amounted to 11,791,051 yen.

9: Yamasaki--298
116, 102, 121

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